Bakery Dough Water Temperature and Ice

Water temperature needed for a desired dough temperature from flour, room and preferment temperatures and mixer friction, and the ice to cool tap water to it.

Method: Bakers' desired dough temperature method

Input parameters

Unit system: SI

Parameter	Value	Unit
Desired dough temperature	26.000	°C
Flour temperature	22.000	°C
Room temperature	25.000	°C
Mixer friction factor	13.000	K
Preferment temperature (0 °C or below = none)	0	°C
Tap water temperature	28.000	°C
Water in the recipe	10.000	kg

Calculated results

Parameter	Value	Unit
Water temperature needed	18.000	°C
Factors counted	3.0000	
Ice (part of the water) to cool tap water	0.92593	kg

Notes for this case

• Bakers balance the temperatures that set the dough's final temperature: the desired dough temperature times the number of factors (three, or four with a preferment) less the flour, room, preferment temperatures and mixer friction gives the water temperature. Friction factors (about 10–15 °C for spiral mixers, more for intensive mixers) are found by measuring a batch. Where the water must be colder than tap water, part of it is replaced by ice, which absorbs about 80 °C worth of heat per kilogram as it melts.

Formula and method

$$T_w = nT_d - (T_f + T_r + \Delta T_m\ [+T_p]), \quad m_i = m_w \frac{T_t - T_w}{T_t + 80}$$

Variables

T_d	Desired dough temperature	K
T_f	Flour temperature	K
T_r	Room temperature	K
ΔT_m	Mixer friction factor	K
T_p	Preferment temperature (0 °C or below = none)	K
T_t	Tap water temperature	K
m_w	Water in the recipe	kg
T_w	Water temperature needed	K
n	Factors counted	-
m_i	Ice (part of the water) to cool tap water	kg

Method and standards

Dough temperature.

Assumptions and limits

- Temperatures in °C; similar heat capacities.

References

Bakers' desired dough temperature method

Report details

Report reference	FCC-1W0M-WQD2 (the same inputs always give the same reference)
Generated	23 November 2026, 18:01 UTC
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/food-dairy/dough-water-temperature

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.